REMARKS

By virtue of this Amendment, claims 1-3 and 7-10 are cancelled without prejudice. Applicants reserve the right to file one or more divisional applications directed to the deleted subject matter.

Claim 11 is amended to incorporate the subject matter in the deleted claim 7.

Following the entry of the amendment, claims 4-6 and 11-19 are presented for further examination. No new matter is added herein.

35 USC §102

Claims 4-6 and 11-19 are rejected under 35 USC 102(b) as allegedly being anticipated by EP 0945066 (hereafter EP '066), as evidenced by Yu et al. *J. Agric. Food Chem.*, **37**, pp. 725-730, 1989, Lawson et al., *Plant Med.*, **57**, pp. 363-364, 1991 and Yeh et al., *J. Nutrit.*, **131**, pp. 989S-993S. Applicants respectfully traverse the rejection.

EP '066 discloses a composition of a pesticide comprising garlic oil or garlic extract; and a second oil selected from the group consisting of oils, minerals oils, fish oils and mixtures thereof. EP '066 differs from the instantly claimed invention for at least the reason that EP '066 fails to disclose that the DAS, DAS2, DAS3 and DAS4 compounds comprise at least one mg. per gram of the pesticide composition. Indeed, as noted in the outstanding Office Action, EP '066 does not even specify that DAS, DAS2, DAS3 and DAS4 compounds are present in the pesticide composition.

In this regard, the Office Action alleges that Lawson et al. discloses that DAS, DAS2, DAS3 and DAS4 are naturally present in garlic oil and extracts and concludes that the garlic extract disclosed in EP '066 contains these compounds too. The Office Action also relies on Yu et al. to assert that the garlic extract disclosed in EP '066 contains 75% of DASn. The Office Action subsequently calculates that the pesticide composition disclosed in EP '066 inherently contains more than 1 mg. of DAS, DAS2, DAS3 and DAS4 per gram of the pesticide composition based on the assumption that 75% of the garlic extract disclosed in EP '066 are DASn.

Applicants respectfully submit that the reliance upon Lawson et al. and Yu et al. as applied by the Office Action to show what the garlic extract disclosed in EP '066 contains is misplaced. The reason is that the composition of a garlic related product is dependant upon how the product is produced. Since the garlic extract disclosed in EP '066 is obtained through a process different from those disclosed in Lawson et al. and Yu et al., it is not proper to rely on Lawson et al. and Yu et al. to show what the garlic extract disclosed in D1 contains.

Specifically, the garlic extract as disclosed in D1 paragraph 13 was prepared by thorough mixing garlic cloves with water in a blender, followed by filtering the mixture with the filtrate collected as garlic extract.

In contrast, Lawson et al. disclose at page 363, right column, first paragraph, that allicin is unstable in the presence of heat and water when garlic is processed and forms a

variety of degradation compounds including diallyl mono, di, and oligosulfides, namely DASn.

Since only water is used in the process disclosed in EP '066 and the reference does not disclose or suggest the use of heat in the extraction process, it is improper to conclude that the garlic extract disclosed in EP '066, which is produced without the use of organic solvent or heat, inherently contains DASn, based on the disclosure of Lawson et al. that allicin from garlic decomposes to form DASn as a result of a process involving organic solvents or heat.

Yu et al. describes garlic essential oils obtained via water distillation, steam distillation or Likens-Nickerson water distillation/solvent extraction and steam distillation/solvent extraction processes. See Yu et al. abstract as well as the paragraph bridging pages 726 and 727. It is known to a person skilled in the art that these garlic distillation processes allow parts of water and volatile compounds, including sulfur compounds to be removed as distillate. The distillate normally has two liquid phases, one contains mainly water, the other contains mainly volatile compounds, which can be separated to provide a garlic essential oil.

As disclosed in Table II as well as at page 729, column 2, of Yu et al., the yields of garlic essential oils range from 0.21 to 0.23% based upon the weight of garlic bulb used in the distillation process. The essential oils are very concentrated since water has been removed. Most of the time, the essential oils are toxic and dangerous.

As discussed above, the garlic extract disclosed in EP '066 is produced by simply mixing water and garlic in a blender

followed by filtration. The filtrate which contains mostly water is the garlic extract used in the examples of EP '066. Compared with garlic essential oils disclosed in Yu et al., the garlic extract disclosed in EP '066 is much more diluted. Accordingly, it is improper to calculate the amounts of DASn in the garlic extract disclosed in EP '066 based on the amounts of DASn contained in the essential oils of Yu et al.

Based on the above discussion, it is respectfully submitted that the outstanding Office Action fails to demonstrate that the pesticide composition disclosed in EP '066 inherently contains at least 1 mg. of DAS, DAS2, DAS3 and DAS4 per one gram of the composition. Indeed, Applicants submit that by reasonable estimation, the amount of DASn disclosed in the composition of EP '066 is much lower than 1 mg. per 1 g of the composition.

Specifically, according to the disclosure of EP '066, 2000 g of fresh garlic is treated with 4000 g of water. In addition, since the dry mass of garlic is around 30% of fresh garlic (see Food Composition and Nutrition Tables, page 835), the garlic extract produced in the reference contains at most 100 g garlic dry mass/kg garlic extract as calculated by (2000 X 30%)/(4000+2000).

In the examples 1-4, the garlic extract is diluted again with a dilution factor from 0.6 to 0.85. EP '066 discloses that the formulations were further diluted before use in ratios ranging from 1/(49+1), i.e., 0.02 to 1/(199+1), i.e., 0.005. Accordingly, the dilution factors are 0.6x0.005 =0.003 or 0.3% of garlic extract, or 0.85 x 0.02=1.7% of garlic extract. Therefore, the pesticide composition disclosed in EP '066 contains 0.3 to 1.71 g garlic dry mass/kg of the pesticide

formulation (100 x 1.7% and 100 x 0.3%), which translates to from 0.03 to 0.17% garlic dry mass by weight based on the weight of the pesticide formulation.

These weak concentrations in garlic explain why, in several examples of EP '066, this garlic extract is no more active than other vegetable oils used alone (see experiment A in which cotton oil alone presents an efficacy of 83.1% versus 89.4% for the garlic extract, see experiment D in which cotton oil presents an efficacy of 44.4% versus 55.6% for the garlic extract, see experiment E, in which cotton oil presents an efficacy of 55% versus 60% for the garlic extract).

Some of experiments show a better activity for the vegetable oils alone compared to the garlic extract (see experiments I and J).

Further, On the basis of the amount of sulfur-containing compounds of fresh garlic from the book "Volatile compounds in foods : qualitative and quantitative data, 7th edition" published by TNO Nutrition and Food Research Institute (Netherlands) (copy attached), we have:

Main sulfides indentified in garlic	Concentration mg/kg fresh garlic
Propylene sulphide	0.83
Dimethyl sulfide	Not known
Allyl methyl sulfide	1.7 - 12
DAS	4.3 - 73
Dimethyl disulfide	1.1
Methyl propyl disulfide	0.56
Allyl methyl disulfide	4.2 - 72.4
Dipropyl disulfide	Not known
DAS2	38.4 -354
Dimethyl trisulfide	1.4 -31
Allyl methyl trisulfide	29 - 160

DAS3	11.1 - 697
DAS4*	Not known.
Sum DAS + DAS2 + DAS3 + DAS4	About 820 (mean value)

*this value has been estimated by the applicant of between 150 and 310 mg/kg on HPLC basis.

According to this document, there is about 820 mg DASn / kg fresh garlic, which is consistent with the value cited in "Source Book of Flavours, 1994" (copy attached) giving a sum of aromatic compounds of 0.1 to 0.25% for fresh garlic.

By calculation, there is 1640 mg DASn in the 6000 g of extract of EP '066. Even if all the DASn have been collected without loss, there is at most 273 mg DASn / kg garlic extract, i.e. 0.27 mg DASn / g. This is much lower and not suggestive of at least 1 mg. of DAS, DAS2, DSA3 and DAS4 per gram of the composition as recited in the instant claims.

Further, as discussed above, in all the examples, the garlic extract prepared were further diluted with a dilution factor between 0.3% and 1.7%. Accordingly, the pesticide formulation disclosed in EP'077 contains at most 0.0046 mg (0.27 x 1.7%) DASn/g of pesticide formulation, which is way below the 1 mg / g level as recited in the instant claims.

For the reasons discussed above, it is respectively submitted that the instantly pending claims are in condition for allowance.

If the Examiner believes a telephone conference would aid in the continued prosecution of this application, the Examiner is invited and encouraged to contact Applicants' representative at the telephone number listed below.

Please charge any fees due with this response to Deposit Account 23-1665 under Customer Number 27267.

Respectfully submitted,

DAVID GAUDOUT ET AL.

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Volatile Compounds in Food

Qualitative and Quantitative Data

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GARLIC (Allium sativum L.) (23B)

Hydrocarbons	Ref. (ppm)
1-propene (= propylene)	73,74(3.2),78

Alcohols	Ref. (ppm)
ethanol	81
2-propen-1-ol (= allyl alcohol)	29,74(43.6),78,81,82(91.3)
1-hexanol	78

Carbonyls, aldehydes	Ref. (ppm)
acetaldehyde (= ethanal)	81
propanal (= propionaldehyde)	63
2-methylbenzaldehyde (= o-tolualdehyde)	74(0.6),78

Carbonyls, ketones	Ref. (ppm)
acetone (= 2-propanone, dimethyl ketone)	81

Acids	Ref. (ppm)
acetic acid	81

Bases	Ref. (ppm)
trimethylamine	63
aniline	74(4.4),78,82(2.5)

Sulfur compounds	Ref. (ppm)
methanethiol (= methyl mercaptan)	61(316),73
1-propanethiol (= propyl mercaptan)	61(20.5)
2-propanethiol (= isopropyl mercaptan)	61(44.7)
2-propene-1-thiol (= allyl mercaptan, allylthiol)	61(3880),73,74(5.44),78,81
1,2-cyclopentanedithiol	78
propylene sulfide (= 2-methylthiirane, 1,2-epithiopropane)	73,74(0.83),78
dimethyl sulfide (= thiobismethane, methylthiomethane)	18,63,81
allyl methyl sulfide (= 1-(methylthio)-2-propene)	56(2.8-12),63,73,74(1.7),78,81
1-propenyl propyl sulfide	73
diallyl sulfide (= thioallyl ether, 1-(allylthio)-2-propene)	14,18,24,29,56(11-73),63,73,74(25.2),78,81,82(4.3)
dimethyl disulfide (= methyldithiomethane)	13,14,18,24,63,73,74(1.1),78,81
methyl propyl disulfide	13,14,24,73,74(0.56),78

GARLIC (Allium sativum L.) (23B)

Sulfur compounds (continued)	Ref. (ppm)
methyl (E)-1-propenyl disulfide	63,74(0.88),78,81
methyl (Z)-1-propenyl disulfide	63,81
allyl methyl disulfide	13,14,24,29,56(4.2-52),63,73,74(72.4),78,81
dipropyl disulfide	13,14,24
(Z)-1-propenyl propyl disulfide	63
allyl propyl disulfide	13,14,24,63,73,74(7.2),78
diallyl disulfide	2,13,14,18,24,29,56(207-354),63,67,73,74(679),81,82(38.4)
dimethyl trisulfide (= 2,3,4-trithiapentane, methyltrithiomethane)	18,29,56(1.4-31),63,73,81
allyl methyl trisulfide	29,56(29-101),63,67,73,74(160),78,81
diallyl trisulfide	18,29,56(211-294),63,67,73,74(697),78,81,82(11.1)
diallyl tetrasulfide	67
(Z)-ajoene	67
(E)-ajoene	67
allicin	14,29,67
isobutyl isothiocyanate	73,74(14.9),78
3-methyl-2-cyclopentene-1-thione	74(1.21)
2,5-dimethyltetrahydrothiophene	73,74(0.42),78
dimethylthiophene (unkn.str.)	63
3,4-dimethyldihydrothiophene-2,5-dione	63
3,5-diethyl-1,2,4-trithiolane	74(13),78
1,3-dithiane	74(1.1),78
4-methyl-5-vinylthiazole	74(0.34),78

Furans	Ref. (ppm)
2,4-dimethylfuran	74(8.8),78

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ONION (Allium cepa L.) (23A)

Hydrocarbons	Ref. (ppm)
1-propene (= propylene)	30

Alcohols	Ref. (ppm)
methanol	5,8,15,36,46
ethanol	8,10,15,36,46
1-propanol (= propyl alcohol)	6,10,15,46,85,86
2-propanol (= isopropyl alcohol)	10

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Chives

Chives used in food as a flavoring and as a garnish are the hollow thin green stems of the alliaceous bulb, *Allium schoenoprasum* L. The plant grows wild throughout northern Europe, Canada and northern United States, but is most widely cultivated as a pot herb. It has a pleasantly delicate onion-like flavor, which is strongest in the young, freshly chopped leaves. The flavor is lost on dehydration, but can be retained for several months under frozen storage. Hashimoto, Miyazawa and Kameoka (1983) and Kallio et al. (1990) have reported on the flavor volatiles in chives.

Garlic

Garlic has been used as a food and medicinally for all of recorded history. It is the compound bulb of *Allium sativum* L., which comprises numerous small hard white or pale pink- to mauve-skinned bulbs, generally known as "cloves," enclosed within a white membranous outer casing. The number and size of the individual cloves are variable as is the flavor, ranging from mild and sweet to almost overpoweringly strong and pungent, depending on the variety and source. Garlic is grown universally in temperate regions and is available commercially as the dried bulb, which has little odor until crushed or cut (Carson 1987).

Garlic contains about 0.1 to 0.25 percent of volatile constituents, formed enzymatically when the cloves are crushed; these can be recovered as so-called oil of garlic by distillation. The flavor of garlic is widely appreciated in cooking, but it should be remembered, particularly by those involved in any kind of sensory assessment, that its odor is very persistent, may taint the breath long after its ingestion, and be objectionable and distracting to others taking part in any sensory evaluation.

Flavoring Forms

Dehydrated Garlic Powder
It is a cream to creamy/white powder prepared by the dehydration of selected cloves of garlic, and has a strongly persistent and characteristic odor and flavor when rehydrated. The flavor character is retained well on storage but, as garlic powder is very hygroscopic, containers should be kept well closed or the product becomes hard and lumpy and loses its flavoring strength. The comparison of flavor level between fresh and dehydrated garlic is approximately 1:5. Garlic powder is widely used in some types of European dry sausages, salami, etc., and if used with discretion, it produces a distinct, pleasing and not overpowering flavor. The dehydrated product is not necessarily ideal as a flavoring, since many of the finer aromatic components are lost during dehydration, the overall profile changes due to partial caramelization of the sugars present, and the enzymatic potential for producing further aromatic constituents is reduced (Moreira-Hernandez, Villegas and Cabrera, 1986 and 1987). Garlic powder tends to have a "boiled" note that is not present in the fresh material.

Garlic Salt
This is a mixture of garlic powder and salt; an anticaking agent such as starch or tricalcium phosphate may be present to maintain free-flowing properties. Standardized dispersions of garlic oil (usually at 0.1 to 0.25 percent) on salt or other suitable edible carriers are also available for use in blended seasonings and are generally preferred.

Encapsulated Garlic Flavors
These are generally spray-dried products containing garlic oil and/or garlic oleoresin or extract encapsulated either in gum acacia or a modified starch. The flavoring strength of these products depends on the manufacturer and range from equal to 10 times stronger than that of garlic powder.

Common Name	Botanical Source	Principal Producing Countries	Main Crop Season	Avg Yield of Essential Oil (%)	Chief Aromatic Constituents	Regulatory Status in U.S.A.
Galangal	Rhizomes of *Alpinia officinarum* Hance.	China		0.5–1		GRAS
Galbanum	Dried gum-resin from *Ferula galbaniflua* Boiss & Buhse and other *Ferula* spp.	Iran, Turkestan		10–22 from the crude resin		Good mfg practice
Garlic	Bulbs of *Allium sativum* L.	U.K., Italy, Egypt, U.S.A.		0.1–0.25	Allyl sulfides	GRAS
Geranium	Leaves and stems of *Pelargonium graveolens* L'Her. and other *Pelargonium* spp.	Réunion, North Africa, Central and Western Europe	Mar. to Oct. depending on region	0.15–0.2 from fresh material	Geraniol, citronellol	GRAS
Ginger	Rhizomes of *Zingiber officinale* Roscoe	Jamaica, West Africa, India, China, Australia	Jamaica: Febr.-Mar.	0.25–1.25	Zingiberone, citral	GRAS
Grapefruit	Peel of *Citrus paradisi* Macf.; fruit by cold expression	U.S.A., East Africa, West Indies, Brazil				GRAS
Guaiac	Wood of *Guaicum officinale* L.; *G. sanctum* L.; or *Bulnesia sarmienti* Lor.	South America, Jamaica, Cuba		approx 5 much lower in local field stills	Guaiol	Good mfg practice
Hemlock (spruce)	Needles and twigs of *Tsuga canadensis* (L.) Carr.; *T. heterophylla* (Raf.) Sarg.; *Picea glauca* (Moench) Voss.; or *P. mariana* (Mill.) B.S.P.	North America, China, Japan			α- and β-Pinenes (terpenes 0.45%), bornyl acetate	Good mfg practice
Hops	Flower catkins of *Humulus lupulus* L.	Europe, North America	Sept.	0.3–0.5	Myrcene, humulene	GRAS
Horsemint (monarda)	Herbaceous tops of *Monarda punctata* L.	U.S.A.		1–3	Thymol (0.60%)	GRAS
Hyssop	Herbaceous tops of *Hyssopus officinalis* L.	Southern Europe	Aug.	0.1–0.3	α-Pinene, sesquiterpene alcohols	GRAS
Immortelle	Flowering tops of *Helichrysum angustifolium* DC.	Mediterranean countries (Yugoslavia)		<0.1	Nerol, neryl acetate	GRAS
Jasmine	Flowers of *Jasminum officinale* L. or *J. grandiflorum* L.	Mediterranean countries, Asia	June to Sept.	3% of concrete containing 40–50 essential oil	Nerol, terpineol, jasmone	GRAS
Juniper berry	Berries of *Juniperus communis* L.	Europe (Italy) Asia, North America	Aug.-Sept.	0.5–0.6 up to 2.5 from dried berries	α-Pinene	GRAS

TOTAL PAGE(S) 012